

## CLAIMS

1. Complex matrix constituted by at least one biocompatible polymer of natural origin, cross-linked, and on which are grafted chains of a molecular weight less than 50,000 Da with an amount of grafting, defined as being the ratio between the number of moles of grafted molecules and the number of moles of units of the polymer of 10 to 40%.
2. Matrix according to claim 1, in which the grafted chains are polymers of natural origin and small size, preferably cellulosic derivatives or derivatives of other biopolymers not naturally present in the human body and/or non-polymer chains having antioxidant properties or properties of inhibition of the degradation reactions of said matrix, preferably vitamins, enzymes or molecules comprising one or several cycles.
3. Matrix according to claim 1 or 2, in which the biocompatible polymer of natural origin is selected from hyaluronic acid, chondroitine sulfate, keratin, keratin sulfate, heparin, heparin sulfate, cellulose and its derivatives, xanthanes and alginates, proteins, or nucleic acids.
4. Matrix according to one of claims 1 to 3, in which the biocompatible polymer of natural origin is a polymer not naturally present in the human body such as a cellulosic derivative, a xanthane or an alginate, which is cross-linked with at least one polymer naturally present in the human body selected from hyaluronic acid, chondroitine sulfate, keratin, keratin sulfate, heparin, heparin

sulfate, xanthanes and alginates, proteins, or nucleic acids.

5. Matrix according to one of claims 1 to 4, in which the amount of reticulation, defined as the ratio between the number of moles of reticulating material ensuring the cross-linkage of the polymer chains and the number of moles of polymer units, is comprised between 0.5 and 50%, in particular between 0.5 and 25% in the case of injectable products, and between 25 and 50% in the case of solid products.

6. Matrix according to claim 5, in which the reticulating substance ensuring the bridging of the chains derived from a bi- or poly-functional molecule selected from epoxids, epihalohydrins and divinylsulfone.

7. Matrix according to one of claims 1 to 6, containing antioxidant agents, vitamins or other dispersed pharmacologically active agents.

8. Matrix according to one of claims 1 to 6, containing vitamins or other dispersed pharmacologically active agents.

9. The use of a matrix according to one of claims 1 to 8, to separate, replace, fill or supplement a biological fluid or tissues.

10. Process for the preparation of a hardly degradable biocompatible matrix constituted by at least one polymer of natural origin, characterized in that it consists: - on the one hand in grafting small chains of molecular weight less

than 50,000 Da with a quantity of grafting of 10 to 40%, - on the other hand cross-linking the principal chains of polymer with each other, to create a homogeneous matrix.

11. Process according to claim 10, in which the molecule or molecules are grafted in a covalent manner to the principal chains of polymer by means of a bi- or poly-functional molecule selected from epoxids, epihalohydrins, or divinylsulfone.